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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/008,340 | 11/13/2001 | Jonathan David Kurtis | 22493-501 (SYMB-1) | 3426 |

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MINTZ, LEVIN, COHN, FERRIS,
GLOVSKY AND POPEO, P.C.
One Financial Center
Boston, MA 02111

EXAMINER

PARAS JR, PETER

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1632

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/008,340 | KURTIS ET AL. | |
| | Examiner | Art Unit | |
| | Peter Paras, Jr. | 1632 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2 and 4-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2 and 4-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0302</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's preliminary amendment received on 9/15/03 has been entered. Claims 2 and 4-11 have been amended. Claims 1, 3, and 16-20 have been cancelled. Claims 2 and 4-15 are pending and are under current examination.

Election/Restrictions

Applicant's election without traverse of Group II, claims 10-15 in Paper No. 0903 is acknowledged.

Claims 2 and 4-9 as amended fall within the scope of the elected invention and are under current examination.

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: it is unsigned by one of the inventors.

Claim Rejections - 35 USC § 112, 1st paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2 and 4-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are directed to a drug delivery device comprising a stably transformed helminth male, wherein said helminth comprises a heterologous nucleic acid molecule, and wherein said helminth is a *Schistosoma* species.

The specification discusses that the invention features a genetically modified helminth for delivery of bioactive agents to hosts. See page 2. The specification further discusses that the featured invention is a genetically modified helminth, particularly a *Schistosoma*, comprising a heterologous nucleic acid encoding a therapeutic protein, wherein the therapeutic protein is produced in said *Schistosoma* and secreted into the host tissue. See pages 4-7. While the specification provides prophetic guidance pertaining to the creation of genetically modified helminths, the specification fails to provide any relevant teachings, specific guidance, or working examples with regard to the creation of any of the genetically modified helminths embraced by the claims. Given the lack of guidance provided by the specification it would have required undue experimentation to make and use the invention as claimed.

While the specification has contemplated the creation of genetically modified helminths, the specification has not provided relevant teachings or specific guidance correlating to creation of any of the genetically modified

helminths embraced by the claims. See pages 4-7. However, the specification has failed to provide correlating to genetic modification of a helminth such that said helminth expresses a heterologous protein. Moreover, the specification has failed to provide any guidance, working examples, or relevant teachings that would allow the skilled artisan to create the invention as claimed, specifically, the specification has not provided any guidance providing a correlation between creation of a genetically modified helminth and secretion of a heterologous protein. It appears the instant specification has not even provided guidance correlating to the creation of a single genetically modified helminth. A mere statement that genetically modified helminths could be created is not sufficient to enable the claimed invention. If there is no disclosure of starting material or of any conditions under which claimed process can be carried out, undue experimentation is required, and there is failure to meet enablement requirement that cannot be rectified by asserting that all disclosure related to process is within skill of art. See *Genentech Inc. v. Novo Nordisk A/S* 42 USPQ2d 1001, 1997. In this case the starting materials that have not been disclosed are the materials need to create a genetically modified helminth embraced by the claims. In addition, the specific conditions for creating a genetically modified helminth have not been disclosed as the specification has only provided general guidance to that end.

Given the lack of guidance provided by the instant specification for the creation of genetically modified helminthes, it would have required undue experimentation for one skilled in the art to make and/or use the claimed invention.

Claims 2 and 4-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are directed to a drug delivery device comprising a stably transformed helminth male, wherein said helminth comprises a heterologous nucleic acid molecule, and wherein said helminth is a *Schistosoma* species.

Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111 (Fed. Cir. 1991), clearly states that “applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*. The invention is, for purposes of the ‘written description’ inquiry, *whatever is now claimed*.” *Vas-Cath Inc. v. Mahurkar*, 19USPQ2d at 1117. The specification does not “clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed.” *Vas-Cath Inc. v. Mahurkar*, 19USPQ2d at 1116.

The genetically modified helminths embraced by the claims have not been disclosed. Based upon the prior art there is expected to be structural variation among the species of helminths. The specification has contemplated that genetically modified helminths could be created. The specification however has not described any genetically modified helminthes and any corresponding heterologous protein produced therefrom. There is no evidence on the record of a relationship between the structures of any of the genetically modified

helminthes embraced by the claims that would provide any reliable information about the structure of helminths within the genus. There is no evidence on the record that helminths had known structural relationships to each other; the art indicated that there is structural variation between helminths. The claimed invention as a whole is not adequately described if the claims require essential or critical elements which are not adequately described in the specification and which is not conventional in the art as of applicants effective filing date.

Possession may be shown by actual reduction to practice, clear depiction of the invention in a detailed drawing, or by describing the invention with sufficient relevant identifying characteristics such that a person skilled in the art would recognize that the inventor had possession of the claimed invention. Pfaff v. Wells Electronics, Inc., 48 USPQ2d 1641, 1646 (1998).

In the instant case the claimed embodiments of genetically modified helminths lack a written description. The specification fails to describe what helminths into this genus and it was unknown as of Applicant's effective filing date that any of these helminths would have the property of producing a heterologous protein. The skilled artisan cannot envision the detailed chemical structure of the encompassed genetically modified helminths, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of creating. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. See *Fiers v. Revel*, 25

USPQ2d 1601, 1606 (Fed. Cir. 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016 (Fed. Cir. 1991).

One cannot describe what one has not conceived. See *Fiddes v. Baird*, 30 USPQ2d 1481, 1483. In *Fiddes*, claims directed to mammalian FGF's were found to be unpatentable due to lack of written description for that broad class. The specification provided only the bovine sequence.

In view of the above considerations one of skill in the art would not recognize that applicant was in possession of the necessary common features or attributes possessed by member of the genus of genetically modified helminths. Moreover, the art has recognized that there would be structural variation among the species of the genus of helminths. Therefore, Applicant was not in possession of the genus genetically modified helminths as encompassed by the claims. University of California v. Eli Lilly and Co., 43 USPQ2d 1398, 1404, 1405 held that to fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1632

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2, 5, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Davis et al (PNAS, 1999, Vol. 96, pages 8687-8692; IDS ref. #C13).

The claims are directed to a genetically modified helminth comprising a heterologous polynucleotide encoding a bioactive agent that is a polypeptide, wherein the helminth is a hookworm, roundworm, pinworm, or tapeworm.

The claims are product-by-process claims in which the process of in which the process of creating the genetically modified helminth carries little patentable weight. It is only the product, which is anticipated by the prior art and not the process by which the product is made. This is because the final product (a genetically modified helminth) is not distinguished by any particular features or characteristics resulting from the process by which it is made. As such, the limitations of the claimed genetically modified helminth are met by any genetically modified helminth in the prior art. Patentability of a product-by-process claim is determined by the novelty and nonobviousness of the claimed product itself without consideration of the process for making it, which is recited in the claims. *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

Davis et al teach a helminth, particularly the roundworm *Ascaris*, comprising a nucleotide sequence encoding a green fluorescent protein. See the abstract as well as the Materials and Methods section on pages 8687-8688.

Thus, the teachings of Davis et al anticipate all of the instant claim limitations.

Claims 2 and 4-15 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 97/11191 (Miller I.).

The claims are directed to a genetically modified helminth comprising a heterologous polynucleotide encoding a bioactive agent that is a polypeptide, wherein the helminth is a hookworm, roundworm, pinworm, or tapeworm, particularly when the helminth is a *Schistosoma*.

The claims are product-by-process claims in which the process of in which the process of creating the genetically modified helminth carries little patentable weight. It is only the product, which is anticipated by the prior art and not the process by which the product is made. This is because the final product (a genetically modified helminth) is not distinguished by any particular features or characteristics resulting from the process by which it is made. As such, the limitations of the claimed genetically modified helminth are met by any genetically modified helminth in the prior art. Patentability of a product-by-process claim is determined by the novelty and nonobviousness of the claimed product itself without consideration of the process for making it, which is recited in the claims. *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

WO 97/11191 teaches genetically modified male schistosomes (see pages 5-9), wherein the schistosomes are *S. mansoni*, *S. hematobium*, or *S. japonicum*. When schistosome eggs are injected with a heterologous nucleic

Art Unit: 1632

acid sequence WO 97/11191 teaches culturing steps to produce miracidia and cercaria comprising the heterologous nucleic acid sequence as well as a snail comprising miracidia. See pages 10-12. WO 97/11191 teaches various proteins that could be produced in a transgenic Schistosoma. For example, the protein could be a secreted glycoprotein hormone such as insulin. See pages 2-4.

Thus, the teachings of WO 97/11191 meet all of the instant claim limitations.

Conclusion

No claim is allowed.

Art Unit: 1632

Any inquiry concerning this communication or earlier communications from the examiner(s) should be directed to Peter Paras, Jr., whose telephone number is 703-308-8340. The examiner can normally be reached Monday-Friday from 8:30 to 4:30 (Eastern time).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Reynolds, can be reached at 703-305-4051. Papers related to this application may be submitted by facsimile transmission. Papers should be faxed via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Official Fax Center number is (703) 872-9306.

Inquiries of a general nature or relating to the status of the application should be directed to Dianiece Jacobs whose telephone number is (703) 305-3388.

Peter Paras, Jr.

Art Unit 1632

**PETER PARAS
PATENT EXAMINER**A handwritten signature in black ink, appearing to read "Pete Paras", written in a cursive style.